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PROGRESS UPDATE

FEBRUARY 1986

AGRICULTURAL RESEARCH SERVICE

PLANT GENETICS AND GERMPLASM INSTITUTE

GERMPLASM RESOURCES INFORMATION NETWORK

(GRIN)

Prepared by

Database Management Unit

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CATALOGING - PREP.

GENERAL INFORMATION

The Germplasm Resources Information Network (GRIN) Database Management Unit (DBMU) wish all of our users and readers a Happy New Year. The current GRIN database (GRIN1) has been very stable since the last 'Progress Update' (September 1985). As the last 'Progress Update' explained, data loading into GRIN1 ceased on 14 September 1985 in order to create the enhanced (GRIN2) database and to enable additional personnel to assist with software writing and data conversion. GRIN1 continues to be available for data retrieval purposes.

The September 'Progress Update' outlined several problems with the Prime minicomputer. The problems, which involved both hardware and the electric power to the computer room, have been resolved. Prime, Inc. engineers installed a new minicomputer chassis which able to handle the large amounts of power needed by the computer. Also, electrical transformers were changed to insure adequate power was available to the computer. The DBMU has been working to have the Uninterruptable Power Supply (UPS) connected to provide a smooth flow of electrical power to the computer machine room. This battery backup will also keep the Prime computer operating for the few critical seconds that are required for the building's auxiliary generator to start.

The DBMU had its biennial review, required by the Beltsville Area administration, on 12 December 1985. The Beltsville Area Office, National Program Staff, and the Agriculture Research Service (ARS) Administrator's office sent representatives to take part in the review. Feedback from the review was very positive. It was indicated that GRIN is indeed providing services that assist National Plant Germplasm

System (NPGS) participants in information management and germplasm maintenance.

A GRIN user was also asked to take part in the GRIN biennial review. Dr. Sam Dietz, the Northwest Area Research Leader and Location Coordinator for the W-6 Regional Plant Introduction Station (RPIS) presented views from the user side of the GRIN system. Some of his major points are presented below.

- In general, GRIN helps to tie the NPGS together through 'on-line' contact, faster availability of information, and faster checking of forwarded information;

- His unit has reduced time in filling seed orders by two-thirds through:

- quicker printing of seed packet labels,

- no proofreading of orders or labels.

- Time savings through quicker generation of planting lists of 'low' accessions;

- Inventory maintenance is less time consuming;

- Time savings through automatic printing of field notebooks including PI number and other identifiers of accessions that are in low supply or have recently been received from the Plant Introduction Office (PIO);

- The field notebooks are automatically formatted for data entry, this ultimately allows faster access to the data by the NPGS;

- In general, all information is more easily accessed and available faster;

- Time savings and error reduction through the downloading of PI accession information into field data capture devices and from reciprocal loading of evaluation information onto the Prime computer;

- Time savings through automatic inventory control which shows which accessions are in low supply;

- Quick listings of accessions that failed to show an adequate germination level are possible;

- Using the system in general, eliminates a great deal of timely and costly proofreading of accession identifiers;

Problems included:

- Occasional computer 'downtime' (much of this has recently been resolved);
- Telephone signal transmission problems from curatorial sites;
- 'Slowness' of working at a 1200 baud rate when many users are on the system (additional and faster Central Processing Unit (CPU) should help to alleviate this problem).

The GRIN database enhancement effort (see September 1985 'Progress Update' for description and reasoning) has been in progress for over a year. This undertaking was initiated to increase the usefulness and efficiency of the GRIN for participants of the NPGS. Benefits of this effort will soon be realized with the implementation of the new database model (GRIN2) in April 1986. A rescheduling of previously set deadlines was made because of previous computer and electrical power problems.

Major differences between GRIN1 and GRIN2 are considerable. These include: an increase in the number of data fields from 312 to 710; an increase from 26 points of fast access to 49; and the accommodation of almost twice as much data (1.8 billion characters). Changes in software were made to facilitate germplasm collection site daily activities. These changes include: collection site data preparation tools; data loading procedures; and a standard reports facility. The current public user programs are being modified to incorporate enhancements to GRIN2 without changing the basic appearance to the user. Additional capabilities will be added to allow the public user to submit germplasm orders for accessions available at germplasm collection sites and to return to the same work area over numerous sessions. This allows longer term access to previously queried information. Anticipated future enhancements to the public procedures

will also offer a greater array of data queries and report options.

The DBMU is establishing a room suitable for training either public or site personnel that come to Beltsville. The room will be able to accomodate five people and is scheduled for use in mid-summer 1986.

A training session for collection site personnel has tentatively been planned for June 1986. Some collection sites will receive individual training at other times because of their use of very specific procedures and the lack of need to know basic collection site utilities (these sites are: the Plant Introduction Office (PIO), the National Seed Storage Laboratory (NSSL) and the Taxonomy Support Staff (TSS)).

SITE INFORMATION

Data conversion and re-loading into GRIN2 from GRIN1 has been the major emphasis of the DBMU data loading personnel since Septmeber 1985. Specific programs and procedures were written to convert existing data into formats compatible with the expanded and reorganized GRIN2 database. As of this writing, taxonomic information including 28,000 scientific names, all 290,000 current GRIN1 accesssion records, all geographic records, and 50,000 evaluation records have been loaded into the GRIN2 database. Additional taxonomic information, NSSL inventory records, 50,000 additional evaluation records, and 14,415 new RANGE-RECORDs are to be loaded by the end of February.

Specific programs (modules) have been written for taxonomic updating, geographic updating, and order processing. These are undergoing testing before release to the principle users. Work on the PIO passport entry system is in progress with expected completion by

the end of March. Collection site personnel can expect to begin daily activities with the new GRIN2 database on 1 April 1986.

CROP ADVISORY COMMITTEE SUPPLEMENT

A special feature to this 'Progress Update' is the following description of the ARS Crop Advisory Committees (CAC). Since last April Mark Bohning has been the facilitator coordinating the CACs and attending most of the CAC meetings. The relationship between GRIN and the CACs is very necessary for the maximum exchange of information and a good user interface. Future 'Progress Updates' will carry a synopsis of recent CAC events.

The National Plant Germplasm System (NPGS) is responsible for providing scientists with the genetic diversity necessary to improve crop productivity and to minimize genetic vulnerability in agricultural crops. The NPGS is involved in several activities including: germplasm aquisition, maintenance, evaluation and enhancement; research on conserving crop diversity; monitoring genetic vulnerability; and information management. Four main components of the NPGS are: 1) plant introduction facilities; 2) germplasm collections; 3) an information system; and 4) advisory groups.

Three key advisory components of the NPGS include the National Plant Genetic Resources Board (NPGRB), the National Plant Germplasm Committee (NPGC), and Crop Advisory Committees (CAC). The NPGRB advises the Secretary of Agriculture on policies relating to plant germplasm. The NPGC develops policies for the conduct of the National Program and provides coordination for the research and service efforts of federal, state, and industry units engaged in the NPGS. These two committees cannot encompass the needed degree of technical expertise on

all the nation's important crops. Therefore, CACs were formed to provide this crop specific information to individuals or organizations such as the NPGRB, NPGC, ARS, State Agricultural Research Stations (SAES), and others. CAC is the generic name for a specific working group of specialists providing analysis, data, and advice about germplasm within a specific crop or group of crops of present or future economic importance.

The membership of a CAC normally follows three basic criteria.

These include:

1. Representation from (but not limited to) SAES, ARS, and private industry.
2. Representation from the various scientific disciplines which are pertinent to germplasm activities (ex. Breeding, Pathology, Entomology, Biotechnology, etc.).
3. A geographical representation from areas where the crop is economically important.

Whenever possible, a CAC should have its origin in an existing national crop improvement conference or association.

Thirty-two CACs are now established. These represent most of the economically important food and fiber crops in the United States. Several additional committees are in various stages of formation. A list of the current CACs and ones which are being formed are found in Appendix I.

The CACs are involved in a variety of activities including:

- 1) Determining the need for and planning of plant explorations.
- 2) Developing genetic vulnerability statements for their respective crops.
- 3) Developing plant descriptor lists to be used in describing the germplasm in collections.
- 4) Developing evaluation proposals for systematically describing the accessions in their respective germplasm collections. The

descriptors include: agronomic, biochemical, anatomic, and morphologic characteristics, disease resistance, insect resistance, and resistance to plant stresses.

5) Developing enhancement proposals which identify ways to more effectively incorporate unadapted germplasm into plant breeding programs.

6) Developing guidelines for determining what germplasm should be preserved in collections.

7) Advising our National Curators of proper procedures for maintaining germplasm.

8) Identifying critical needs and concerns on matters related to germplasm and bringing these to the attention of the appropriate groups and/or individuals in the NPGS.

The development of plant descriptor lists is an activity which all CACs have either completed or are currently working on. Once developed, these descriptors are incorporated into GRIN2 along with any evaluation data. A large amount of evaluation data has also been collected by scientists in the past. The CAC will need to advise the GRIN DBMU as to the validity of this data and whether or not it should be loaded into the database.

In 1983, the responsibility for facilitating the CACs was assigned to the Plant Genetics and Germplasm Institute (PGGI) of the Beltsville Agricultural Research Center. The facilitator assists in the formation, direction, and maintenance of CACs. One specific duty is to act as a liaison between the CACs and GRIN. Because the CACs will be heavily involved in collecting data to be entered into the GRIN database and retrieving data from the system, they will need to be familiar with the capabilities and constraints of the GRIN system. The GRIN DBMU in turn needs the crop specific advice provided by the CACs. The facilitator also communicates with 'Diversity' magazine and provides its editor with information pertaining to CACs, GRIN, and the NPGS in general. As time permits, the facilitator assists in loading germplasm evaluation data into GRIN.

APPENDIX I

CACS CURRENTLY ESTABLISHED

CAC	CHAIRMAN
Alfalfa	Jim Elgin
Barley	T. M. Starling
Carya	Thomas Thompson
Citrus	Jack Hearn
Clover	Richard Smith
Cotton	R. Bridge
Crucifer	Paul Williams
Grass	Kay Asay
Juglans	Gale McGranahan
Maize	Major Goodman
Malus	Roger Way
Oats	Darrell Wesenberg
Pea	Lloyd Cruger
Peanut	Charles Simpson
Phaseolus	Michael Dickson
Potato	Robert Hanneman
Prunus	David Ramming
Pyrus	Richard Bell
Rice	Neil Rutger
Root & Bulb	Philipp Simon
Small Fruits	Jim Ballington
Sorghum	Keith Schertz
Soybean	Thomas Kilen
Sugarbeet	Devon Doney
Sugarcane	Donald Heinz
Sunflower	Jerry Miller
Sweet Potatoes	James Moyer
Tomato	Edward Tigchelaar
Vigna	Richard Fery
Vine crops	Jim McCreight
Vitis	Robert Pool
Wheat	W. McCuistion

FUTURE CACS

Asparagus
 Florist Crops
 Leafy Vegetables
 Tropical Fruit And Nuts
 Woody Ornamentals

